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L5	0	"10697592".pn.	US-PGPUB; USPAT	OR	OFF	2006/08/13 16:23
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L7	50	invoke and application and modes and privileged and "non privileged" and request and function and interrupt and execut\$3 and direct\$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2006/08/13 16:34
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1 [Fast detection of communication patterns in distributed executions](#)

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Publisher: IBM Press

Full text available: pdf(4.21 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

2 [Status report of the graphic standards planning committee](#)

Computer Graphics staff

August 1979 **ACM SIGGRAPH Computer Graphics**, Volume 13 Issue 3

Publisher: ACM Press

Full text available: pdf(15.01 MB) Additional Information: [full citation](#), [references](#), [citations](#)

3 [Architecture of the IBM system/370](#)

Richard P. Case, Andris Padegs

January 1978 **Communications of the ACM**, Volume 21 Issue 1

Publisher: ACM Press

Full text available: pdf(2.78 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper discusses the design considerations for the architectural extensions that distinguish System/370 from System/360. It comments on some experiences with the original objectives for System/360 and on the efforts to achieve them, and it describes the reasons and objectives for extending the architecture. It covers virtual storage, program control, data-manipulation instructions, timing facilities, multiprocessing, debugging and monitoring, error handling, and input/output operations. ...

Keywords: architecture, computer systems, error handling, instruction sets, virtual storage

4 Remus: a security-enhanced operating system



Massimo Bernaschi, Emanuele Gabrielli, Luigi V. Mancini

February 2002 **ACM Transactions on Information and System Security (TISSEC)**, Volume 5 Issue 1

Publisher: ACM Press

Full text available: pdf(295.33 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present a detailed analysis of the UNIX system calls and classify them according to their level of threat with respect to system penetration. Based on these results, an effective mechanism is proposed to control the invocation of critical, from the security viewpoint, system calls. The integration into existing UNIX operating systems is carried out by instrumenting the code of the system calls in such a way that the execution is granted only in the case where the invoking process and the valu ...

Keywords: Access control, Linux, privileged tasks, system calls interception, system penetration

5 Pioneer: verifying code integrity and enforcing untampered code execution on legacy systems



Arvind Seshadri, Mark Luk, Elaine Shi, Adrian Perrig, Leendert van Doorn, Pradeep Khosla

October 2005 **ACM SIGOPS Operating Systems Review , Proceedings of the twentieth ACM symposium on Operating systems principles SOSP '05**, Volume 39 Issue 5

Publisher: ACM Press

Full text available: pdf(264.30 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We propose a primitive, called Pioneer, as a first step towards verifiable code execution on untrusted legacy hosts. Pioneer does not require any hardware support such as secure co-processors or CPU-architecture extensions. We implement Pioneer on an Intel Pentium IV Xeon processor. Pioneer can be used as a basic building block to build security systems. We demonstrate this by building a kernel rootkit detector.

Keywords: dynamic root of trust, rootkit detection, self-check-summing code, software-based code attestation, verifiable code execution

6 Making operating systems more robust: Improving the reliability of commodity operating systems



Michael M. Swift, Brian N. Bershad, Henry M. Levy

October 2003 **Proceedings of the nineteenth ACM symposium on Operating systems principles**

Publisher: ACM Press

Full text available: pdf(262.78 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Despite decades of research in extensible operating system technology, extensions such as device drivers remain a significant cause of system failures. In Windows XP, for example, drivers account for 85% of recently reported failures. This paper describes Nooks, a *reliability subsystem* that seeks to greatly enhance OS reliability by isolating the OS from driver failures. The Nooks approach is practical: rather than guaranteeing complete fault tolerance through a new (and incompatible) OS ...

Keywords: I/O, device drivers, protection, recovery, virtual memory

7 Special issue: AI in engineering

 D. Sriram, R. Joobbani
April 1985 **ACM SIGART Bulletin**, Issue 92

Publisher: ACM Press

Full text available:  [pdf\(8.79 MB\)](#) Additional Information: [full citation](#), [abstract](#)

The papers in this special issue were compiled from responses to the announcement in the July 1984 issue of the SIGART newsletter and notices posted over the ARPAnet. The interest being shown in this area is reflected in the sixty papers received from over six countries. About half the papers were received over the computer network.

8 Hypervisor-based fault tolerance

 T. C. Bressoud, F. B. Schneider
December 1995 **ACM SIGOPS Operating Systems Review , Proceedings of the fifteenth ACM symposium on Operating systems principles SOSP '95**, Volume 29
Issue 5

Publisher: ACM Press

Full text available:  [pdf\(1.26 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)


9 MCTS customer task environment

 R. R. Brown
October 1975 **ACM SIGOPS Operating Systems Review**, Volume 9 Issue 4

Publisher: ACM Press

Full text available:  [pdf\(2.04 MB\)](#) Additional Information: [full citation](#), [references](#)

10 An analysis of operating system behavior on a simultaneous multithreaded architecture

 Joshua A. Redstone, Susan J. Eggers, Henry M. Levy
November 2000 **ACM SIGARCH Computer Architecture News , ACM SIGOPS Operating Systems Review , Proceedings of the ninth international conference on Architectural support for programming languages and operating systems ASPLOS-IX**, Volume 28 , 34 Issue 5 , 5

Publisher: ACM Press

Full text available:  [pdf\(227.80 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

This paper presents the first analysis of operating system execution on a simultaneous multithreaded (SMT) processor. While SMT has been studied extensively over the past 6 years, previous research has focused entirely on user-mode execution. However, many of the applications most amenable to multithreading technologies spend a significant fraction of their time in kernel code. A full understanding of the behavior of such workloads therefore requires execution and measurement of the operating sy ...

11 An analysis of operating system behavior on a simultaneous multithreaded architecture

 Joshua A. Redstone, Susan J. Eggers, Henry M. Levy
November 2000 **ACM SIGPLAN Notices**, Volume 35 Issue 11

Publisher: ACM Press

Full text available:  [pdf\(1.56 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper presents the first analysis of operating system execution on a simultaneous


multithreaded (SMT) processor. While SMT has been studied extensively over the past 6 years, previous research has focused entirely on user-mode execution. However, many of the applications most amenable to multithreading technologies spend a significant fraction of their time in kernel code. A full understanding of the behavior of such workloads therefore requires execution and measurement of the operating sy ...

12 Process management and exception handling in multiprocessor operating systems using object-oriented design techniques

Vincent Russo, Gary Johnston, Roy Campbell

January 1988 **ACM SIGPLAN Notices , Conference proceedings on Object-oriented programming systems, languages and applications OOPSLA '88**, Volume 23 Issue 11

Publisher: ACM Press

Full text available:  [pdf\(1.22 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


The programming of the interrupt handling mechanisms, process switching primitives, scheduling mechanisms, and synchronization primitives of an operating system for a multiprocessor require both efficient code in order to support the needs of high-performance or real-time applications and careful organization to facilitate maintenance. Although many advantages have been claimed for object-oriented class hierarchical languages and their corresponding design methodologies, the application of ...

13 EROS: a fast capability system

Jonathan S. Shapiro, Jonathan M. Smith, David J. Farber

December 1999 **ACM SIGOPS Operating Systems Review , Proceedings of the seventeenth ACM symposium on Operating systems principles SOSP '99**, Volume 33 Issue 5

Publisher: ACM Press

Full text available:  [pdf\(1.83 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


EROS is a capability-based operating system for commodity processors which uses a single level storage model. The single level store's persistence is transparent to applications. The performance consequences of support for transparent persistence and capability-based architectures are generally believed to be negative. Surprisingly, the basic operations of EROS (such as IPC) are generally comparable in cost to similar operations in conventional systems. This is demonstrated with a set of microbe ...

14 A taxonomy of computer program security flaws

Carl E. Landwehr, Alan R. Bull, John P. McDermott, William S. Choi

September 1994 **ACM Computing Surveys (CSUR)**, Volume 26 Issue 3

Publisher: ACM Press

Full text available:  [pdf\(3.81 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

An organized record of actual flaws can be useful to computer system designers, programmers, analysts, administrators, and users. This survey provides a taxonomy for computer program security flaws, with an Appendix that documents 50 actual security flaws. These flaws have all been described previously in the open literature, but in widely separated places. For those new to the field of computer security, they provide a good introduction to the characteristics of security flaws and how they ...

Keywords: error/defect classification, security flaw, taxonomy

15 A Large Scale, Homogenous, Fully Distributed Parallel Machine, II


-  Herbert Sullivan, Theodore R. Bashkow, David Klappholz
March 1977 **ACM SIGARCH Computer Architecture News , Proceedings of the 4th annual symposium on Computer architecture ISCA '77**, Volume 5 Issue 7

Publisher: ACM Press

Full text available:  pdf(560.05 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The present paper complements the hardware proposal for a fully distributed parallel processor presented in "A Large Scale, Homogeneous, Fully Distributed Parallel Machine, I," by describing a suitable software structure for its operating system management. It is shown that the most basic operating system functions can be performed on a purely local basis, i.e. in such a fashion that identical pieces of the operating systems are concurrently executed by each of the processing el ...

16 Operating system: The persistent relevance of the local operating system to global applications

-  Jay Lepreau, Bryan Ford, Mike Hibler
September 1996 **Proceedings of the 7th workshop on ACM SIGOPS European workshop: Systems support for worldwide applications**

Publisher: ACM Press

Full text available:  pdf(628.93 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

The growth and popularity of loosely-coupled distributed systems such as the World Wide Web and the touting of Java-based systems as the solution to the issues of software maintenance, flexibility, and security are changing the research emphasis away from traditional single node operating system issues. Apparently, the view is that traditional OS issues are either solved problems or minor problems. By contrast, we believe that building such vast distributed systems upon the fragile infrastrucur ...

17 A verifiable protection system

-  Gerald J. Popek, Charles S. Kline
April 1975 **ACM SIGPLAN Notices , Proceedings of the international conference on Reliable software**, Volume 10 Issue 6

Publisher: ACM Press

Full text available:  pdf(1.03 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper reports on the design and implementation of the UCLA Virtual Machine System, a multiuser operating system base that has been developed to provide ultra high reliability protection and security. Details are presented of the UCLA-VM system, a prototype of which now exists. Concepts which have influenced its structure are discussed, including program verification, security kernels, virtual machines, virtual memory, and the need for flexible information sharing facilities. A new mech ...

Keywords: Capability fault, Levels of kernels, Protection, Security, Security kernel, Verification, Virtual machines, Virtual memory

18 ARPS: a new real-time computer

-  Kenneth J. Thurber
October 1976 **ACM SIGARCH Computer Architecture News**, Volume 5 Issue 4

Publisher: ACM Press

Full text available:  pdf(1.14 MB) Additional Information: [full citation](#), [references](#), [citations](#)

19 Collecting and Exploiting High-Accuracy Call Graph Profiles in Virtual Machines

Matthew Arnold, David Grove

March 2005 **Proceedings of the international symposium on Code generation and optimization CGO '05**

Publisher: IEEE Computer Society

Full text available:  [pdf\(238.98 KB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Due to the high dynamic frequency of virtual method calls in typical object-oriented programs, feedback-directed devirtualization and inlining is one of the most important optimizations performed by high-performance virtual machines. A critical input to effective feedback-directed inlining is an accurate dynamic call graph. In a virtual machine, the dynamic call graph is computed online during program execution. Therefore, to maximize overall system performance, the profiling mechanism must stri ...


20 The arpanet telnet protocol: Its purpose, principles, implementation, and impact on host operating system design



J. Davidson, W. Hathaway, J. Postel, N. Mimno, R. Thomas, D. Walden

September 1977 **Proceedings of the fifth symposium on Data communications**

Publisher: ACM Press

Full text available:  [pdf\(1.32 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The protocol discussed in this paper was developed by many members of the ARPANET community starting in 1969 and continuing through the present. Many individuals and institutions have been members of this community at one time or another over the years. A review of the documents, both working and published, written on the subject of this protocol reveals that the following individuals were among those who contributed to the protocol design: A. Bhushan, R. Braden, R. Bressler, J. Burchfiel, ...

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